What is claimed is:

1. A method for concealing errors in an encoded bit stream indicative of speech signals received in a speech decoder, wherein the encoded bit stream includes a plurality of speech frames arranged in speech sequences, and the speech frames include at least one partially corrupted frame preceded by one or more non-corrupted frames, wherein the partially corrupted frame includes a first long-term prediction lag value and a first long-term prediction gain value, and the non-corrupted frames include second long-term prediction lag values and second long-term prediction gain values, and wherein the second long-term prediction lag values include a last long-term prediction lag value, and the second long-term prediction gain values include a last long-term prediction gain value, said method comprising the steps of:

providing an upper limit and a lower limit based on the second long-term prediction lag values;

determining whether the first long-term prediction lag value is within or outside the upper and lower limits;

replacing the first long-term prediction lag value in the partially corrupted frame with a third lag value, when the first long-term prediction lag value is outside the upper and lower limits; and

retaining the first long-term prediction lag value in the partially corrupted frame when the first long-term prediction lag value is within the upper and lower limits.

2. The method of claim 1, further comprising the step of replacing the first long-term prediction gain value in the partially corrupted frame with a third gain value, when the first long-term lag value is outside the upper and lower limits.

3. The method of claim 1, wherein the third lag value is calculated based the second long-term prediction lag values and an adaptively-limited random lag jitter bound by further limits determined based on the second long-term prediction lag values.

4. The method of claim 2, wherein the third gain value is calculated based on of the second long-term prediction gain values and an adaptively-limited random gain jitter bound

by limits determined based on the second long-term prediction gain values.

5. A method for concealing errors in an encoded bit stream indicative of speech signals received in a speech decoder, wherein the encoded bit stream includes a plurality of speech frames arranged in speech sequences, and the speech frames include at least one corrupted frame preceded by one or more non-corrupted frames, wherein the corrupted frame includes a first long-term prediction lag value and a first long-term prediction gain value, and the non-corrupted frames include second long-term prediction lag values and second long-term prediction gain values, and wherein the second long-term prediction lag values include a last long-term prediction lag value, and the second long-term prediction gain values include a last long-term prediction gain value and the speech sequences include stationary and non-stationary speech sequences, and wherein the corrupted frame can be a totally corrupted frame or a partially corrupted frame, said method comprising the steps of:

determining whether the corrupted frame is partially corrupted or totally corrupted;

replacing the first long-term prediction lag value in the corrupted frame with a third lag value if the corrupted frame is totally corrupted; and

replacing the first long-term prediction lag value in the corrupted frame with a fourth lag value if the corrupted frame is partially corrupted.

6. The method of claim 5, further comprising the steps of:

determining whether the speech sequence in which the partially corrupted frame is arranged is stationary or non-stationary;

setting the fourth lag value equal to the last long-term prediction lag value, when said speech sequence is stationary ; and

determining the fourth lag value based on a decoded long-term prediction lag value searched from an adaptive codebook associated with the non-corrupted frame preceding the corrupted frame, when said speech sequence is non-stationary.

7. The method of claim 5, further comprising the steps of:

determining whether the speech sequence in which the totally corrupted frame is

arranged is stationary or non-stationary;

setting the third lag value equal to the last long-term prediction lag value, when said speech sequence is stationary; and

determining the third lag value based on the second long-term prediction values and an adaptively-limited random lag jitter, when said speech sequence is non-stationary.

8. The method of claim 5, wherein the second long-term prediction lag values further include a second last long-term prediction lag value and a third last long-term prediction lag value, and the second long-term prediction gain values further include a second last long-term prediction gain value and a third last long-term prediction gain value, said method further comprising the steps of:

determining minLag, which is the smallest lag value among the second long-term prediction lag values;

determining maxLag, which is the largest lag value among the second long-term prediction lag values;

determining meanLag, which is an average of the second long-term prediction lag values;

determining difLag, which is the difference of maxLad and minLag;

determining minGain, which is the smallest gain value among the second long-term prediction gain values;

determining maxGain, which is the largest gain value among the second long-term prediction gain values; and

determining meanGain, which is an average of the second long term gain values; wherein

if difLag < 10, and minLag < the fourth lag value < maxLag + 5; or

if the last long-term prediction gain value is larger than 0.5, and the second last long-term prediction gain value is larger than 0.5, and the fourth lag value is smaller than a sum of the last long-term prediction value and 10, and a sum of the fourth lag value and 10 is larger than the last long-term prediction value; or

if minGain < 0.4, and the last long-term prediction gain value is equal to minGain, and

the fourth lag value is larger than minLag but smaller than maxLag; or

if difLag < 70, and the fourth lag value is larger than minLag but smaller than maxLag; or

if the fourth lag value is larger than meanLag but smaller than maxLag; then the corrupted frame is determined as partially corrupted.

9. The method of claim 6, wherein when said speech sequence is non-stationary, said method further comprising the step of determining a frame-error rate of the speech frames such that

if the frame-error rate reaches a determined value, the fourth lag value is determined based on said decoded long-term prediction lag value, and

if the frame-error rate is smaller than the determined value, the fourth lag value is set equal to the last long-term prediction lag value.

10. The method of claim 5, wherein the stationary speech sequences include voiced sequences, and the non-stationary speech sequences include unvoiced sequences.

11. A speech signal transmitter and receiver system for encoding speech signals in an encoded bit stream and decoding the encoded bit stream into synthesized speech, wherein the encoded bit stream includes a plurality of speech frames arranged in speech sequences, and the speech frames include at least one corrupted frame preceded by one or more non-corrupted frames, wherein the corrupted frame includes frame a first long-term prediction lag value and a first long-term prediction gain value, and the non-corrupted frames include second long-term prediction lag values and second long-term prediction gain values, and wherein the second long-term prediction lag values include a last long-term prediction lag value and the second long-term prediction gain values include a last long-term prediction gain value, and the speech sequences include stationary and non-stationary speech sequences, and a first signal is used to indicate the corrupted frame, said system comprising:

a first means, responsive to the first signal, for determining whether the speech sequence in which the corrupted frame is arranged is stationary or non-stationary, and for

providing a second signal indicative of said determining;

a second means, responsive to the second signal, for replacing the first long-term prediction lag value in the corrupted frame with the last long-term prediction lag value when said speech sequence is stationary, and replacing the first long-term prediction lag value in the corrupted frame with a third lag value when said speech sequence is non-stationary.

12. The system of claim 11, wherein the third lag value is determined based on the second long-term prediction lag values and an adaptively-limited random lag jitter.

13. The system of claim 11, wherein the second means further replaces the first long-term prediction gain value in the corrupted frame with a third gain value when said speech sequence is non-stationary.

14. The system of claim 13, wherein the third gain value is determined based on the second long-term prediction gain values and an adaptively-limited random gain jitter.

15. The system of claim 11, wherein the stationary speech sequences include voiced sequences, and the non-stationary speech sequences include unvoiced sequences.

16. A decoder for synthesizing speech from an encoded bit stream, wherein the encoded bit stream includes a plurality of speech frames arranged in speech sequences, and the speech frames include at least one corrupted frame preceded by one or more non-corrupted frames, wherein the corrupted frame includes a first long-term prediction lag value and a first long-term prediction gain value, and the non-corrupted frames include second long-term prediction lag values and second long-term prediction gain values, and wherein the second long-term prediction lag values include a last long-term prediction lag value and the second long-term prediction gain values include a last long-term prediction gain value and the speech sequences include stationary and non-stationary speech sequences, and a first signal is used to indicate the corrupted frame, said decoder comprising:

a first means, responsive to the first signal, for determining whether the speech

sequence in which the corrupted frame is arranged is stationary or non-stationary, and for providing a second signal indicative of said determining;

a second means, responsive to the second signal, for replacing the first long-term prediction lag value in the corrupted frame with the last long-term prediction lag value when said speech sequence is stationary, and replacing the first long-term prediction lag value in the corrupted frame with a third lag value when said speech sequence is non-stationary.

17. The decoder of claim 16, wherein the lag value is determined based on the second long-term prediction lag values and an adaptively-limited random lag jitter.

18. The decoder of claim 16, wherein the second means further replaces the first long-term gain value in the corrupted frame with a third gain value when said speech sequence is non-stationary.

19. The decoder of claim 18, wherein the third gain value is determined based on the second long-term prediction gain values and an adaptively-limited random gain jitter.

20. The decoder of claim 16, wherein the stationary speech sequences include voiced sequences, and the non-stationary speech sequences include unvoiced sequences.

21. A mobile station, which is arranged to receive an encoded bit stream containing speech data indicative of speech signals, wherein the encoded bit stream includes a plurality of speech frames arranged in speech sequences, and the speech frames include at least one corrupted frame preceded by one or more non-corrupted frames, wherein the corrupted frame includes a first long-term prediction lag value and a first long-term prediction gain value, and the non-corrupted frames include second long-term prediction lag values and second long-term prediction gain values, and wherein the second long-term prediction lag values include a last long-term prediction lag value and the second long-term prediction gain values include a last long-term prediction gain value and the speech sequences include stationary and non-stationary speech sequences, and wherein a first signal is used to indicate the corrupted

frame, said mobile station comprising:

a first means, responsive to the first signal, for determining whether the speech sequence in which the corrupted frame is arranged is stationary or non-stationary, and for providing a second signal indicative of said determining; and

a second means, responsive to the second signal, for replacing the first long-term prediction lag value in the corrupted frame with the last long-term prediction lag value when said speech sequence is stationary, and replacing the first long-term prediction lag value in the corrupted frame with a third lag value when said speech sequence is non-stationary.

22. The mobile station of claim 21, wherein the third lag value is determined based on the second long-term prediction lag values and an adaptively-limited random lag jitter.

23. The mobile station of claim 21, wherein the second means further replaces the first long-term gain value in the corrupted frame with a third gain value when said speech sequence is non-stationary.

24. The mobile station of claim 23, wherein the third gain value is determined based on the second long-term prediction gain values and an adaptively-limited random gain jitter.

25. The mobile station of claim 21, wherein the stationary speech sequences include voiced sequences, and the non-stationary speech sequences include unvoiced sequences.

26. An element in a telecommunication network, which is arranged to receive an encoded bit stream containing speech data from a mobile station, wherein the speech data includes a plurality of speech frames arranged in speech sequences, and the speech frames include at least one corrupted frame preceded by one or more non-corrupted frames, wherein the corrupted frame includes a first long-term prediction lag value and a first long-term prediction gain value, and the non-corrupted frames include second long-term prediction lag values and second long-term prediction gain values, and wherein the second long-term prediction lag values include a last long-term prediction lag value and the second long-term prediction gain

values include a last long-term prediction gain value and the speech sequences include stationary and non-stationary speech sequences, and wherein a first signal is used to indicate the corrupted frame, said element comprising:

a first means, responsive to the first signal, for determining whether the speech sequence in which the corrupted frame is arranged is stationary or non-stationary, and for providing a second signal indicative of said determining; and

a second means, responsive to the second signal, for replacing the first long-term prediction lag value in the corrupted frame with the last long-term prediction lag value when said speech sequence is stationary, and replacing the first long-term prediction lag value in the corrupted frame with a third lag value when said speech sequence is non-stationary.

27. The element of claim 26, wherein the third long-term prediction lag value is determined based on the second long-term prediction lag values and an adaptively-limited random lag jitter.

28. The element of claim 26, wherein the third means further replaces the first long-term prediction gain value with a third gain value when said speech sequence is non-stationary.

29. The element of claim 28, wherein the third gain value is determined based on the second long-term prediction gain values and an adaptively-limited random gain jitter.

30. The element of claim 26, wherein the stationary speech sequences include voiced sequences, and the non-stationary speech sequences include unvoiced sequences.